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COMPARING VARIOUS CHANNEL ESTIMATION TECHNIQUES FOR OFDM SYSTEMS USING MATLAB

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ABSTRACT

This paper compares the performance of various channel estimation techniques for OFDM systems over quasi-static channels using MATLab. It compares the performance of five channel estimation techniques, these are: decision directed (DD), linear interpolation, second-order interpolation, discrete Fourier transform (DFT) interpolation, minimum mean square error (MMSE) interpolation. The performance is evaluated in terms of two widely-used performance measures, namely, bit-error rate (BER) and the mean square error (MSE) for different levels of signal-to-noise ratio (SNR). The OFDM model is explained and implemented using MATLab to run different simulations. The simulation results demonstrate that the DD channel estimation provides the lowest BER and MSE as compared to interpolation techniques, at the cost of extra processing delay and comparatively sensitive to channel variations between OFDM symbols. Also, the MMSE interpolation outperforms all other interpolation techniques.

KEYWORDS

OFDM, pilot-based channel estimation, pilot allocation, direct decision, interpolation channel estimation, LS, MMSE, MATLab.

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A COMPARATIVE STUDY ON DIFFERENT TRUST BASED ROUTING SCHEMES IN MANET

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ABSTRACT

A mobile ad hoc network is a wireless network in which no infrastructure is available. MANET is a selfconfiguring network. Due to dynamic nature of MANET it is very challenging work to employ a secure route. The intermediate nodes cooperate with each other as there is no such base station or access point. The routing protocols play important role in transferring data. Cryptographic mechanisms are used in routing protocols to secure data packets while transmitted in the network. But cryptographic techniques incur a high computational cost and can't identify the nodes with malicious intention. So, employing cryptographic techniques in MANET are quite impractical as MANETs have limited resource and vulnerable to several security attacks. Trust mechanism is used as an alternative to cryptographic technique. Trust mechanism secures data forwarding by isolating nodes with malicious intention using trust value on the nodes. In this paper we survey different trust based protocols of MANET and compare their performances.

KEYWORDS

Network Protocols, Wireless Network, Mobile Network, Virus, Worms &Trojon

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A PRACTICAL ROUTE RECONSTRUCTION METHOD FOR WI-FI MESH NETWORKS IN DISASTER SITUATION WITH SPARE AP

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ABSTRACT

Computer networks comprise essential infrastructure in modern society and must function even in a disaster situation. Therefore, fault-tolerant networks are being actively studied. Disaster information systems, however, suffer from two main issues: lack of their utilization in peacetime and the difficulty for a non-expert to manage them should a disaster strike. Therefore, we place special emphasis on the development of a reliable network infrastructure that can function during both normal and disaster times, using a Wi-Fi-based wireless mesh network. In a large-scale disaster situation, our goal is to identify a way to reconstruct the mesh network by adding the minimum number of spare access points (APs) to ensure the reachability of all mesh routers to the backbone network. Furthermore, we consider that only public workers without any experience with wireless communication technologies must decide upon the adequate locations for spare APs and install them. Both of simulation experiments and field trial prove the effectiveness of the proposed methods.

KEYWORDS

Wi-Fi, wireless mesh network, disaster, rerouting

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ENERGY EFFICIENT HIERARCHICAL CLUSTER HEAD ELECTION USING EXPONENTIAL DECAY FUNCTION PREDICTION

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ABSTRACT

In the recent years, wireless sensor network (WSN) have witnessed increased interest in information gathering in applications such as combat field reconnaissance, security surveillance, environmental monitoring, patient health monitoring and so on. Thus, there is a need for scalable and energy-efficient routing, data gathering and aggregation protocols in these WSN environments. Various hierarchical clustering Protocols have been proposed by authors for WSN to improve system stability, lifetime, and energy efficiency. Clustering involves grouping nodes into disjoint and non-overlapping clusters. In this paper we motivate the need for clustering. Secondly, we present general classification of published clustering schemes. Thirdly, we review some existing clustering algorithms proposed for WSNs; highlighting their objectives, features, and so on. Finally, we develop an Average Energy (AvE) prediction algorithm using exponential decay function $y=Ae^{-ax}+B$. We then combine this function with the probabilistic distributed LEACH of algorithm to determine suitable CHs. The combined algorithm was implemented on MATLAB simulator and tested for homogenous network. The result gathered from the simulation shows that the extended algorithm in homogenous network mode is able to achieve 39% stability, 11% Average energy Dissipation per round and 40% Lifespan better than LEACH-Homo. This paper proposes a new direction in improving energy efficiency of WSN routing protocol, which is desirable in some critical WSN applications. .

KEYWORDS

Wireless sensors networks, Clustering, Routing, sensor node, Average Energy, round, exponential decay curve

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POSITION ESTIMATION OF AUTONOMOUS UNDERWATER SENSORS USING THE VIRTUAL LONG BASELINE METHOD

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ABSTRACT

This article contains a description of a mathematical model of an acoustic system for positioning autonomous underwater sensors using the virtual long base method, which can be used during the vessel's collection of information over the deployed underwater network of autonomous sensors (underwater wireless sensors network), during the initial determination of the geographical position of the bottom long baseline elements or search, including cooperative, with the use of a swarm of autonomous surface vehicles (UASV) of emergency submerged objects equipped with an emergency beacon (for example, aircraft and ships); The article provides a scheme of an experimental set of equipment, as well as a description of the conducted field experiments and their results.

KEYWORDS

Underwater positioning system, VLBL, underwater wireless sensor network, emergency beacon positioning

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EMERGING WIRELESS TECHNOLOGIES IN THE INTERNET OF THINGS: A COMPARATIVE STUDY

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ABSTRACT

The Internet of Things (IoT) incorporates multiple long-range, short-range, and personal area wireless networks and technologies into the designs of IoT applications. This enables numerous business opportunities in fields as diverse as e-health, smart cities, smart homes, among many others. This research analyses some of the major evolving and enabling wireless technologies in the IoT. Particularly, it focuses on ZigBee, 6LoWPAN, Bluetooth Low Energy, LoRa, and the different versions of Wi-Fi including the recent IEEE 802.11ah protocol. The studies evaluate the capabilities and behaviours of these technologies regarding various metrics including the data range and rate, network size, RF Channels and Bandwidth, and power consumption. It is concluded that there is a need to develop a multifaceted technology approach to enable interoperable and secure communications in the IoT.

KEYWORDS

Internet of Things, Wireless Technologies, Low-power, M2M Communications.

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SIMULATION AND VERIFICATION TWO YAGI-UDI AND S-BAND SATELLITE DISH GROUND STATION ANTENNAS FOR LEO NANOSATELLITES COMMUNICATIONS

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ABSTRACT

Ground station antennas are a part of TTC system, generally, Yagi-Udi antennas and Parabola dish antenna are using in Earth segment to communicate with LEO small satellites, this paper uniquely presents the three huge antennas of a ground station which are communicating with some microsatellites with view window above Beijing, China. The ground station contains two Yagi-Udi antennas for VHF/UHF and an S-band dish antenna for reception of payloads data. For verification feasibility of the antennas, simulations have been accomplished according to the antennas requirements. Eventually, the simulations assisted to recognize the matched commercial ground station antennas based on comparison of the simulations with commercial antennas and the matched ones are chosen for the implementation on the ground station.

KEYWORDS

Amateur radio antenna, Telemetry and Tracking, Yagi-Udi antenna, parabolic dish antenna, ground station antennas.

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PERFORMANCE ANALYSIS OF LOCAL ANCHOR BASED 5G HETNETS USING STOCHASTIC GEOMETRY

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ABSTRACT

In heterogeneous 5G networks (HetNets) a local anchor node ensures coordination among small cell low power nodes (LPNs). User equipment (UE) that cannot directly reach the local anchor node will transmit and receive data through LPN. To facilitate measurement of the interference power for this 2-hop hierarchical network topology, a total distance distribution between a UE and a local anchor is derived as a closed form expression in terms of hypergeometric functions. This distribution can be directly utilized in the interference power and outage probability analysis. Numerical results show that the interference power can be tightly approximated using the derived distribution for large distances, which significantly eases the outage probability analysis.

KEYWORDS

Stochastic geometry, interference analysis, two-tier networks, local anchor.

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IMPLEMENTATION OF A NEW IR-UWB SYSTEM BASED ON M-OAM MODULATION ON FPGA COMPONENT

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ABSTRACT

This paper presents the implementation of an Impulse Radio Ultra Wide Band (IR-UWB) communication system based on Orthogonal Amplitude Modulation (OAM) on the FPGA board (Field Programmable Gate Array). The Orthogonal Amplitude Modulation is a new modulation technique that provides a high data rate transmission, using the orthogonal waveforms named MGF (ModifiedGegenbaeur Function). In this work, the FPGA card and the converters DAC(Digital-to-Analog Converter) and ADC (Analog to Digital Converter) are considered to perform the implementation. The system is running in the simulation field and in the real system on the hardware equipment.The obtained results show that the implementation of UWBOAM system on FPGA board is running well andprovide a high - real time computations system.

KEYWORDS

UWB, FPGA, OAM, ADC, DAC, simulation, real time system

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